



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,196	11/30/2001	Viresh Ratnakar	AP119TP	6294

20178 7590 05/04/2005

EPSON RESEARCH AND DEVELOPMENT INC  
INTELLECTUAL PROPERTY DEPT  
150 RIVER OAKS PARKWAY, SUITE 225  
SAN JOSE, CA 95134

EXAMINER

TABATABAI, ABOLFAZL

ART UNIT PAPER NUMBER

2625

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/010,196

Applicant(s)

RATNAKAR ET AL

Examiner

Abolfazl Tabatabai

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 April 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/15/02:10/1/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

1. Applicant's election without traverse of Group I claims 1-27 in the reply filed on April 6, 2005 is acknowledged.

### **Claim Rejections - 35 USC § 103**

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1, 6, 8-11, 13, 17, 18, 23 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeung et al (U S 6,668,246 B1) in view of Wu et al (U S 6,285,775 B1).

Regarding claim 1, Yeung discloses a method for inserting a watermark in digital data that comprises a plurality of blocks of coded transform coefficients, each block

containing one of a first type of coefficient and a plurality of a second type of coefficient, the method comprising the step of:

applying a scrambling algorithm to each block in a predetermined pattern area of the digital data to insert the watermark in the digital data such that the resulting watermarked digital data is format compliant (column 9, lines 32-50), the scrambling algorithm being applied by performing at least one of the following scrambling operations (column 6, lines 32-46):

(i) for at least some of the blocks in the pattern area, XORing magnitude bits of each of selected ones of the second type of coefficient with a pseudo random number,

(ii) for a select number of pairs of blocks in the pattern area, swapping the plurality of second type coefficients from one block in each pair with the plurality of second type coefficients from the other block in the pair,

(iii) for blocks in a first sequence of blocks in the pattern area, shuffling differential values of the first type of coefficient among blocks in the first sequence, or

(iv) for blocks in a second sequence of blocks in the pattern area, shuffling select bits of the first type of coefficient among blocks in the second sequence.

However, Yeung is silent about the specific details regarding the step of:

(iv) for blocks in a second sequence of blocks in the pattern area, shuffling select bits of the first type of coefficient among blocks in the second sequence.

In the same field of endeavor (watermarking), However, Wu discloses watermarking scheme for image authentication comprising the step of:

(iv) for blocks in a second sequence of blocks in the pattern area, shuffling select bits of the first type of coefficient among blocks in the second sequence (column 10, lines 21-39).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use shuffling select bits of the first type of coefficient among blocks as taught by Wu in the system of Yeung because Wu provides Yeung an improved system for watermarking digital images for authentication purposes and concerns "shuffling" the coefficients prior to the embedding step. Such shuffling may involve concatenating the coefficients of a plurality of blocks into a string and randomly shuffling the order of the coefficients in the string.

Regarding claim 6, Yeung discloses the method of claim 1, wherein the scrambling algorithm is reversible (column 6, lines 21-31).

Regarding claim 8, Yeung is silent about the specific details regarding the method of claim 1, wherein the scrambling algorithm is applied by performing at least operation (ii), and wherein the select number of pairs of blocks to which operation (ii) is applied are constrained to lie within a predetermined number of rows of digital data. In the same field of endeavor (watermarking), However, Wu discloses watermarking scheme for image authentication comprises the scrambling algorithm is applied by performing at least operation (ii), and wherein the select number of pairs of blocks to which operation (ii) is applied are constrained to lie within a predetermined number of rows of digital data (column 10, lines 47-61).

Regarding claim 9, Yeung is silent about the specific details regarding 9. The

method of claim 1, wherein the scrambling algorithm is applied by performing at least operation (iii), and wherein the differential values of the first type of coefficient are shuffled among blocks in the first sequence without changing the sum of the values of the first type of coefficient in the first sequence of blocks.

In the same field of endeavor (watermarking), However, Wu discloses watermarking scheme for image authentication comprises the differential values of the first type of coefficient are shuffled among blocks in the first sequence without changing the sum of the values of the first type of coefficient in the first sequence of blocks (column 10, lines 21-64 and column 12, lines 12-23).

Regarding claim 10, Yeung is silent about the specific details regarding 10. The method of claim 1, wherein the scrambling algorithm is applied by performing at least operation (iv), and wherein the select bits of the first type of coefficient that are shuffled among blocks in the second sequence are select left-most bits.

In the In the same field of endeavor (watermarking), However, Wu discloses watermarking scheme for image authentication comprises scrambling algorithm is applied by performing at least operation (iv), and wherein the select bits of the first type of coefficient that are shuffled among blocks in the second sequence are select left-most bits (column 10, lines 21-64).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use changing the sum of the values of the first type of coefficient as taught by Wu in the system of Yeung because Wu provides Yeung an improved system for watermarking digital images for authentication purposes and concerns

“shuffling” the coefficients prior to the embedding step. Such shuffling may involve concatenating the coefficients of a plurality of blocks into a string and randomly shuffling the order of the coefficients in the string.

Regarding claim 11, Yeung discloses a method for inserting multiple watermarks in an image that comprises a plurality of blocks of coded transform coefficients, each block containing one of a first type of coefficient and a plurality of a second type of coefficient, the method comprising the steps of:

applying a first watermark to each block in a first predetermined pattern area of the image (column 9, lines 32-45 and column 12, lines 4-6); and,

applying a second watermark to each block in a second predetermined pattern area of the image (column 9, lines 32-45); wherein multiple watermarks are inserted such that the resulting watermarked image is format compliant, each watermark being applied by performing at least one of the following scrambling operations (column 6, lines 32-46):

(i) for at least some of the blocks in the pattern area, XORing magnitude bits of each of selected ones of the second type of coefficient with a pseudo random number, (ii) for a select number of pairs of blocks in the pattern area, swapping the plurality of second type coefficients from one block in each pair with the plurality of second type coefficients from the other block in the pair, (iii) for blocks in a first sequence of blocks in the pattern area, shuffling differential values of the first type of coefficient among blocks in the first sequence, or (iv) for blocks in a second sequence of blocks in the pattern area, shuffling

Art Unit: 2625

select bits of the first type of coefficient among blocks in the second sequence.

However, Yeung is silent about the specific details regarding the step of:

(iv) for blocks in a second sequence of blocks in the pattern area, shuffling select bits of the first type of coefficient among blocks in the second sequence.

In the same field of endeavor (watermarking), However, Wu discloses watermarking scheme for image authentication comprising the step of:

(iv) for blocks in a second sequence of blocks in the pattern area, shuffling select bits of the first type of coefficient among blocks in the second sequence (column 10, lines 21-39).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use shuffling select bits of the first type of coefficient among blocks as taught by Wu in the system of Yeung because Wu provides Yeung an improved system for watermarking digital images for authentication purposes and concerns "shuffling" the coefficients prior to the embedding step. Such shuffling may involve concatenating the coefficients of a plurality of blocks into a string and randomly shuffling the order of the coefficients in the string.

Regarding claim 13, Yeung discloses an apparatus for inserting a watermark in digital data that comprises a plurality of blocks of coded transform coefficients, each block containing one of a first type of coefficient and a plurality of a second type of coefficient, the apparatus comprising:

a processing device configured to apply a scrambling algorithm to each block in a predetermined pattern area of the digital data to insert the watermark in the digital



Art Unit: 2625

data such that the resulting watermarked digital data is format compliant, the scrambling algorithm being applied by performing at least one of the following scrambling operations (Fig.1 element 130 and column 6, lines 32-

(i) for at least some of the blocks in the pattern area, XORing magnitude bits of each of selected ones of the second type of coefficient with a pseudo random number,

(ii) for a select number of pairs of blocks in the pattern area, swapping the plurality of second type coefficients from one block in each pair with the plurality of second type coefficients from the other block in the pair,

(iii) for blocks in a first sequence of blocks in the pattern area, shuffling differential values of the first type of coefficient among blocks in the first sequence, or

(iv) for blocks in a second sequence of blocks in the pattern area, shuffling select bits of the first type of coefficient among blocks in the second sequence.

However, Yeung is silent about the specific details regarding the step of:

(iv) for blocks in a second sequence of blocks in the pattern area, shuffling select bits of the first type of coefficient among blocks in the second sequence.

In the same field of endeavor (watermarking), However, Wu discloses watermarking scheme for image authentication comprising the step of:

(iv) for blocks in a second sequence of blocks in the pattern area, shuffling select bits of the first type of coefficient among blocks in the second sequence (column 10, lines 21-39).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use shuffling select bits of the first type of coefficient among

blocks as taught by Wu in the system of Yeung because Wu provides Yeung an improved system for watermarking digital images for authentication purposes and concerns "shuffling" the coefficients prior to the embedding step. Such shuffling may involve concatenating the coefficients of a plurality of blocks into a string and randomly shuffling the order of the coefficients in the string.

Regarding claim 17, Yeung discloses the apparatus of claim 13, wherein the processing device is at least one of a microprocessor, an application specific integrated circuit, or a digital signal processor (fig. 1 element 130).

Claim 18 is similarly analyzed as claim 1 above.

Claim 23 is similarly analyzed as claim 6 above.

Claim 25 is similarly analyzed as claim 8 above.

Claim 26 is similarly analyzed as claim 9 above.

Claim 27 is similarly analyzed as claim 10 above.

3. Claims 2-4, 14-16 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeung et al (U S 6,668,246 B1) and Wu et al (U S 6,285,775 B1) as applied to claims 1, 13 and 18 further in view of Zang (U S 6,154,541).

Regarding claim 2, Yeung and Wu are silent about the specific details regarding the method of claim 1, wherein the scrambling algorithm is applied by performing at least two of the scrambling operations.

In the In the same field of endeavor (watermarking), However, Zang discloses a system for a robust high-speed cryptosystem comprises the scrambling algorithm is applied by performing at least two of the scrambling operations (column 8, lines 1-16).

Regarding claim 3, Yeung and Wu are silent about the specific details regarding the method of claim 1, wherein the scrambling algorithm is applied by performing at least three of the scrambling operations.

In the same field of endeavor (watermarking), However, Wu discloses watermarking scheme for image authentication comprises the scrambling algorithm is applied by performing at least three of the scrambling operations (column 8, lines 1-16).

Regarding claim 4, Yeung and Wu are silent about the specific details regarding the method of claim 1, wherein the scrambling algorithm is applied by performing all four of the scrambling operations.

In the In the same field of endeavor (watermarking), However, Wu discloses watermarking scheme for image authentication comprises the scrambling algorithm is applied by performing all four of the scrambling operations (column 8, lines 1-16).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use performing all four of the scrambling operations as taught by Zang in the system of Yeung because Zang provides Yeung an improved system for implementing cryptosystems to provide fast, easy key generation and also a method for simple, low cost hardware implementation of fast cryptosystems.

Claim 14 is similarly analyzed as claim 2 above.

Claim 15 is similarly analyzed as claim 3 above.

Claim 16 is similarly analyzed as claim 4 above.

Claim 19 is similarly analyzed as claim 2 above.

Claim 20 is similarly analyzed as claim 3 above.

Claim 21 is similarly analyzed as claim 4 above.

4. Claims 5 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeung et al (U S 6,668,246 B1) and Wu et al (U S 6,285,775 B1) as applied to claims 1 and 18 further in view of Rao et al (U S 6,222,932 B1).

Regarding claim 5, Yeung and Wu are silent about the specific details regarding the inserted watermark is visible and obtrusive.

In the same field of endeavor (watermarking), However, In the In the same field of endeavor (watermarking), However, Rao discloses automatic adjustment of image watermark strength based on computed image texture comprises the inserted watermark is visible and obtrusive (column 3, lines 11-13).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use inserted watermark is visible and obtrusive as taught by Rao in the system of Yeung because Rao provides Yeung an improved system which the brightness of pixels is altered by reducing or increasing it by a perceptually uniform amount, which is pre-determined by the user.

Claim 22 is similarly analyzed as claim 5 above.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yeung et al (U S 6,668,246 B1) and Wu et al (U S 6,285,775 B1) as applied to claims 1, 13 and 18 further in view of Zang (U S 6,154,541).

Regarding claim 12, Yeung and Wu are silent about the specific details regarding

Art Unit: 2625

the first predetermined pattern area comprises a central area of the image and the second predetermined pattern area comprises a peripheral ring surrounding the central area.

In the same field of endeavor (watermarking), However, Rhoads discloses security documents with digital data comprises a peripheral ring surrounding the central area (fig. 20, element 870 and column 47, lines 1-9).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a peripheral ring surrounding the central area as taught by Rhoads in the system of Yeung because Rhoads provides Yeung an improved system which is relates to video signal processing and more particularly relates to the processing of such signals to embed auxiliary data, and subsequent extraction and use of such data. And one of the advantageous inherent in such a system is the high degree of statistical confidence (confidence with doubles with each successive bit of identification code) that a match is really a match.

### **Allowable Subject Matter**

6. Claims 7 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### **Other Prior Art**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2625

Kato et al (U S 6,671,376 B1) disclose video scramble/descramble apparatus.

Davis et al (U S 6,611,607 B1) disclose integration digital watermarks in multimedia content.

Rhoads (U S 6,611,725 B1) disclose watermark enabled video objects.

Cox et al (U S 6,359,475 B1) discloses method and system for protecting digital data from unauthorized copying.

### **Contact Information**

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (571) 272-7458.

The Examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mehta Bhavesh M, can be reached at (571) 272-7453. The fax phone number for organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Abolfazl Tabatabai

Patent Examiner

Application/Control Number: 10/010,196

Page 14

Art Unit: 2625

Group Art Unit 2625

April 29, 2005

*A. Tabatabaie*

*K. Patel*  
KANJIBHAI PATEL  
PRIMARY EXAMINER